

DOCUMENT RESUME

ED 168 662

JC 790 249

AUTHOR Goodwin, John R.; O'Reilly, Robert R.
TITLE Context and Structure of Educational Organizations:
Application of Aston Methodologies to Community
Colleges.
PUB DATE 10 Apr 79
NOTE 30p.; Paper presented at the Annual Meeting of the
American Educational Research Association (San
Francisco, California, April 8-12, 1979)
EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Administrator Role; Centralization; Community
Colleges; Horizontal Organization; *Junior Colleges;
*Organization; *Organizational Theories;
*Organization Size (Groups); *Power Structure;
Specialization; Vertical Organization
IDENTIFIERS Ontario

ABSTRACT

Interviews were conducted with the presidents and senior administrators of 20 Colleges of Applied Arts and Technology located in the province of Ontario (Canada) to assess the relationship between organizational size and organizational structure. It was found that a relationship existed between the size variable and certain structural dimensions. Size was positively related to specialization, delegation, vertical span, and supervisory span (subordinate ratio), and was negatively related to centralization. However, the forecasted size-formulation relationship was very small. The fact that the size variable showed a strong relationship with certain organizational structural variables led to the conclusion that size is important in influencing structural dimensions in the organization. The results contributed to organization theory in three ways: (1) the number of full-time employees was supported as an adequate measure of size; (2) the generalization of the relationship between organizational size and dimensions of organizational structure was upheld; and (3) the proposition that size is predictive of structure was supported. Another result of the study was that the applicability of the Aston methodology for research on educational organizations was demonstrated. A bibliography is included. (MB)

* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *

ED168662

Context and Structure of Educational Organizations:
Application of Aston Methodologies to Community Colleges

John R. Goodwin
Concordia University, Montreal
Robert R. O'Reilly
University of Ottawa, Ottawa

"PERMISSION TO REPRODUCE THIS
MATERIAL HAS BEEN GRANTED BY

John R. Goodwin

Robert R. O'Reilly

TO THE EDUCATIONAL RESOURCES
INFORMATION CENTER (ERIC) AND
USERS OF THE ERIC SYSTEM."

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRO-
DUCED EXACTLY AS RECEIVED FROM
THE PERSON OR ORGANIZATION ORIGIN-
ATING IT. POINTS OF VIEW OR OPINIONS
STATED DO NOT NECESSARILY REPRESENT
OFFICIAL NATIONAL INSTITUTE OF
EDUCATION POSITION OR POLICY

Paper presented as part of a symposium on "Organizational and
Policy Issues in Colleges and Universities" at the annual
meeting of the American Educational Research Association,
San Francisco, April 10, 1979.

John R. Goodwin (Ph.D. - University of Ottawa) is Assistant
Professor of Management at Concordia University. Robert R. O'Reilly
(Ph.D. - University of Alberta) is Associate Professor of Education
Administration at University of Ottawa. Please address correspondence
to Professor Goodwin at 7141 Sherbrooke St. West, Montreal, Quebec,
Canada, H4B 1R6.

JC 790 249

Is organizational size predictive of and causal of the organizational structural dimensions found in complex organizations? A predominant assumption in the literature, relating to the total organization, contends that organizational size has far reaching effects on other organizational characteristics. This concern over size has stimulated a great deal of research, however, the conclusions reached with regard to the size relationship are rather contradictory and inconsistent.

Many of the studies assume implicitly that a positive relationship exists between size and bureaucratic structure, that is, as it increases in size the organization becomes more bureaucratic. However the implicitness of the relationship is questioned. Woodward (1958, 1965) indicates size had little effect on organizational structure. Indeed she reports relationships between structure and technology.

Studying six dimensions of bureaucracy, Hall (1961) reports that bureaucracy does not exist in a present-absent dichotomy but that the dimensions appear to be present to some degree in all organizations. Further he recognizes that organizational size has been intuitively accepted as a possible contributor to the bureaucratic structure of the organization. He therefore hypothesized a positive relationship between size and structure. A small correlation was reported between these two variables. Hall concluded size was apparently not a critical factor in the degree of bureaucratization. A later study suggests "size may be rather irrelevant as a factor in determining organizational structure" (Hall et al., 1967: 912).

On the other hand Pugh et al. (1963), Hickson et al. (1969), Blau and Schoenherr (1971), Child (1972), Khandwalla (1974), and

Holdaway et al. (1975) contend that size is a major determining factor of organizational structure. The Aston group suggest one explanation for the inconsistent findings.

There has been almost no systematic exploration of the causal connection between contextual factors and certain administrative systems rather than others or certain groups and individual behaviour rather than others (Pugh et al., 1963: 291).

The Aston group (Pugh et al., 1963) believed the structural concepts are central to organizational theory. However, these concepts remain primitive in empirical application.

What is needed is precise formulation of characteristics of organizational structure, and development of measuring scales which will assess the differences quantitatively (Pugh and Hickson, 1968: 375).

Drawing on the conceptual framework and terminology of primary organizational structural dimensions provided by the classical organizational theorists, and in particular Weber's bureaucracy, the Aston group fairly adequately encompass the differences in organizational structure in six primary dimensions. These dimensions include specialization, formalization, standardization, centralization, configuration and flexibility. As a result of establishing and operationalizing these dimensions of structure it becomes possible to study relationships between dimensions of context and dimensions of structure. This objective-measuring device provides researchers with a much needed method of comparison between organizations.

Consequently, in their 1969 article, Pugh et al. postulate that organizational structure is closely related to the context within which it functions and that these contextual dimensions might explain much of the variation in organizational structure. Based on the concepts advanced by

Bakke (1959), this group delineates and operationalizes organization and history, ownership and control, size, charter, technology, location, and dependence as the organizational contextual variables. The relationships between context and structure support size, dependence, location, and technology as predictors of dimensions of organizational structure.

Research supports the generalization that organizational contextual variables and organizational structural variables are related. What are the determinants of the variability in organizational structural characteristics? Size and technology appear to account for a large portion of the structural variations. What is the role of size?

To answer this question, there is a need to select a particular dimension of context a priori as the determining variable of the structure. A sample or population with considerable homogeneity appears to be preferable for a comparison of variables. This strategy controls for, rather than measures, variables which may otherwise explain organizational structure.

This study looks at the contextual dimension size. Through the selection of a population of a unique group of homogeneous organizations, this study controls for or holds constant all the identified contextual variables other than size. Thus it was postulated that any significant differences in structural dimensions are basically due to the size variable.

The basic framework for analyzing structure and size was based on the work of Pugh et al. as modified by Reimann (1973) and Holdaway et al. (1975). The study reported here was concerned with (a) the relationships between the contextual variable size and a set of structural variables in

a college population and (b) the applicability of the Aston models and methodologies to educational organizations.

POPULATION

For this study, the population consists of twenty Colleges of Applied Arts and Technology located in the province of Ontario. The colleges are of one type of institution: publicly supported colleges of applied arts and technology. Established by the Government of Ontario as crown corporations in 1965, these institutions provide non-university, post-secondary education for adults and out-of-school youths. The size ranges from 189 to 1,285 full-time employees, with the mean size being 582.5.

The colleges operate as separate corporations under the Ministry of Colleges and Universities and are governed by their own board of governors. The college areas are established using previously delineated economic regions as the prime criterion. All colleges are supported partially by tuition fees and by government grants.

INSTRUMENTATION

A comprehensive interview schedule, to assess organizational size and organizational structure, was used to gather data for this study. Interviews, conducted with the President and senior executives of the colleges were used to gather factual information about the colleges. Based on the standard interview schedule, each interview lasted between one and two hours.

VARIABLES

(a) Constant Contextual Variables

Pugh et al. (1969) conceptualized seven contextual variables which have been advanced as possible predictors of structural dimensions. The predictive effect of each of six contextual variables was assumed to have a similar or constant effect on the structural dimensions of each college. The assumed constant contextual variables are discussed below in order to indicate the similar effect these variables have on each college.

Origin and History was operationally defined through three major aspects: impersonality of origin, age, and historical change. As the college concept was a radical departure in the Ontario education system, legislation established the colleges in 1965. Twenty colleges opened their doors in 1967. It is noted that measures of origin, age, and historical change are similar for each college.

Ownership and Control was operationalized by measures of public accountability and the relationship of the ownership to the management. Each college was a crown corporation with a board of governors to set policy and be legally responsible for the operation. Each board is responsible to the Council of Regents, the provincial regulatory agency within the Ministry of Colleges and Universities. Thus, each college has high public accountability and similar relationships.

Charter. The purpose or goals of the organization in terms of its output and the ideological aspects were operationally defined by the Ministry of Colleges and Universities, making the charter very similar for each college.

Technology. By sampling from a general product group, control appears to be exerted over technology. Woodward (1958) reasons that organizations in the same technology have similar organization structure. Thus it is deduced that the effects of technology on each college structure is very similar.

Location. This concept reflects the geographic, cultural, and community setting. While location varies for each college, an attempt was made to make each area comparable. All the colleges are in the province of Ontario. Each college is located in a comparative economic region. Further criteria to balance the effect of location include: (a) projection of student enrollment, (b) geographic nature of the region, (c) economic resources, and (d) the economic function. It is assumed the balanced criteria within each location results in the effects of this variable being similar for each college.

(b) Contextual Variable Size

What is size? Generally size has been accepted as either a contextual or structural variable and then operationally defined in terms of such measurement as the number of employees. Some size measures are used because of the availability of data, other measures are justified on the grounds they were used in previous studies. Hall (1963) indicates the number of employees is a good measure of size as it correlates highly with other size measures. However Child reports, for five possible measures of size, the intercorrelations range from 0.31 to 0.88.

Can one valid, readily available measure of size be used as an index of the concept size? Kimberly (1975) conceives a number of conceptually independent but important aspects which should be included in measuring size. These aspects take into account physical capacity, personnel, inputs and outputs, and discretionary resources. He contends the correlation between the various measure are not sufficient to justify the use of only one measure of size as being the same concept.

Are the size dimensions intercorrelated for this population of institutions? This study uses four operationally defined dimensions of size that appear to measure the important size aspects as brought forth by Kimberly. The college size dimensions include the number of full-time employees, number of full-time equivalent students, number of courses and total institutional revenue. The four measures of size, for each of the colleges, are presented in Table 1.

TABLE 1 ABOUT HERE

A Pearson product-moment correlation matrix of the four measures of size is presented in Table 2. It is clear from Table 2 that the measures of size correlate very highly and clearly support the unidimensionality of size. The high correlations would indicate each measurement is measuring a large portion of the same dimension. Thus it appears the measurement of size using "the number of employees" is an adequate measure. This measure is used for this study.

TABLE 1
Size Characteristics - Ontario Colleges
of Applied Arts and Technology
(N=20 Organizations)

8.

College	Full-Time Employees 1974/75	Cost FTE Students 1974/75	Programs 1974/75	Total Institutional Revenue (Million) 1974/75
01. Algonquin	1285	10067	109	27.8
02. Cambrian	282	2615	51	7.6
03. Canadore	223	1522	25	5.1
04. Centennial	643	4589	73	13.5
05. Conestoga	650	4374	38	11.9
06. Confederation	382	2318	35	8.9
07. Durham	189	1511	33	3.8
08. Fanshawe	832	6563	89	17.7
09. George Brown	1213	10195	79	26.5
10. Georgian	371	2486	38	7.9
11. Humber	1030	8250	76	21.4
14. Mohawk	828	6197	37	18.0
15. Niagara	438	2900	57	9.7
16. Northern	282	1349	26	5.7
17. St. Clair	536	4745	51	12.5
18. St. Lawrence	573	4461	68	12.8
19. Sault	277	1812	38	5.7
20. Seneca	786	7464	63	19.4
21. Sheridan	512	4754	56	12.9
22. Sir Sanford Fleming	318	2673	44	6.2

TABLE 2 ABOUT HERE

(c) Structural Variables

Part of the data was collected using the revised schedule of the Aston group structural variables (Inkson et al., 1970). These measures included the following:

1. Functional specialization measured as the number of support non-line functions carried out by designated workers at least half of their available working day (Holdaway et al., 1975).
2. Formalization of role definition measured the extent to which rules, procedures, instructions and other communications were written (Inkson et al., 1970).
3. Autonomy measured as the degree to which decisions are made within the unit of the organization (Inkson et al., 1970).

Data were gathered on other measures deemed to represent some major dimensions of organizational structure. Based on Reimann (1973: 465-467), scales which measure the delegation of authority, centralization index and vertical span were added to this instrument.

4. Delegation of authority measured as the ratio of the number of specific management decisions the chief executive delegated to the number he had authority to make (Reimann, 1973).
5. Centralization measured as a function of (a) the locus of decision making with respect to major and specific functional policies, (b) the degree of information sharing between levels, and (c) the degree of participation in long-range planning (Reimann, 1973).
6. Vertical span measured as the number of levels in the hierarchy including the top-chief executive-and-bottom-worker level (Reimann, 1973).

TABLE 2
Product-Moment Correlations Maxtrix of
Alternative Measures of Organizational Size
(N=20 Organizations)

Variables	1	2	3	4
1. Number of Full-time Employees	1.000	.9820	.8132	.9900
2. Number of Full-time Equivalent Students		1.000	.8227	.9920
3. Number of Programs			1.000	.8236
4. Total Institutional Revenue (Millions)				1.000

Note: All correlations are significant at the .001 level

Finally data was collected on five configurational variables using the Holdaway et al. (1975) schedule.

7. Chief executive span of control measured as the number of employees who report directly to the chief executive officer (Holdaway et al., 1975).
8. The subordinate ratio measured as the mean number of instructors who report to their immediate supervisor, such as department chairmen (Holdaway et al., 1975).
9. Percentage of clerks measured as the percentage of employees who were engaged in clerical duties (Holdaway et al., 1975).
10. Percentage of non-workflow personnel, the percentage of employees who were not engaged in instruction or supervision (Holdaway et al., 1975).
11. Percentage of superordinates (administrative ratio) measured as the full-time equivalent percentage of employees in supervisory positions, including non-workflow supervisory positions (Holdaway et al., 1975).

These measures were considered representative of the major factors of organizational structure.

ANALYSIS OF THE RESULTS

This study was concerned with the structural differences and the relationship of the differences with organizational size. The attention given to size was stimulated by the potential predictive role as postulated in the Astor and subsequent studies, and as predicted by the conceptualized theoretical model. Using data collected at one point in time, while controlling for technology and other contextual variables, size was assumed to be predictive of the differences in organizational structure. The literature indicated support for positive relationship

between size and specialization, formalization (Pugh et al., 1969; Inkson et al., 1970; Child, 1972), vertical span (Blau and Schoenherr, 1971; Hinings and Lee, 1971; Child, 1972), and chief executive span of control (Dale, 1952; Entwistle and Walton, 1961; Blau and Schoenherr, 1971), but not for such structural variables as clerical ratio (Blau and Schoenherr, 1971; James, 1972), autonomy (Pugh et al., 1969; Reimann, 1973) and non-workflow personnel (Pugh et al., 1969).

A negative ratio appeared likely for the percentage of superordinates (Anderson and Warkov, 1961; Rushing, 1967; Holdaway and Blower, 1971; Champion and Betterton, 1973) and centralization (Hinings and Lee, 1971; Child, 1973).

The results presented in Table 3, supported the size-structure relationship. It was found that organizational size was positively related to specialization (0.75), delegation (0.85), vertical span of control (0.68), supervisory span (0.62) and was negatively related to centralization (-0.41). All relationships were significant at the .05 level.

TABLE 3 ABOUT HERE

Despite differences between the samples, the above findings can be interpreted in the light of Pugh et al. (1968), and ensuing research. The relationships between organizational size and organizational structural variables, for relevant studies, are displayed in Table 4.

TABLE 3
Product Moment Correlations of Alternative Measures of Size
With Selected Variables of the Organization Structure
(N=20 Organizations)

	Special- ization	Formal- ization	Autonomy	Dele- gation	Central- ization	Vertical Span	C.E. Span	Supervisor Span	% Clerk	% Nonwork- flow Personnel	% Super- ordinate
Number of Employees	.7527*** (.001)	.1700 (.237)	.0200 (.467)	.8528*** (.001)	-.4099* (.036)	.6843*** (.001)	-.0644 (.394)	.6254** (.002)	.2609 (.133)	.1243 (.301)	-.2042 (.194)
Number of Full-time Equivalent Students	.7843*** (.001)	.0818 (.366)	-.0241 (.460)	.8825*** (.001)	-.3760* (.050)	.6959*** (.001)	-.1184 (.310)	.6372*** (.001)	.3098 (.092)	.1905 (.211)	-.2744 (.121)
Number of Courses	.5219** (.009)	.1307 (.291)	-.0263 (.456)	.8246*** (.001)	-.3938* (.043)	.3814* (.49)	-.2934 (.105)	.5595** (.005)	.4643* (.020)	.2126 (.184)	-.2221 (.173)
Institutional Total Revenue (Millions)	.7437*** (.001)	.1268 (.297)	-.0275 (.454)	.8649*** (.001)	-.3849* (.047)	.6761*** (.001)	-.0883 (.356)	.6553*** (.001)	.3289 (.078)	.1899 (.201)	-.2184 (.178)

Note: * significant at .05 level
 ** significant at .01 level
 *** significant at .001 level

The structural variables, specialization and vertical span, have a high positive relationship with size. As size increases, specialization and vertical span likewise increase. It is noted the Holdaway et al. study (1975) reports a smaller relationship between size and specialization. This may be due to the very small organizational size of their population. It may be postulated from the data on Table 4 and the results of this study that as the organization size increases specialization also increases therefore a sequence or ordering of specialization may be considered.

Little relationship is found between size and autonomy, chief executive span, percentage of non-workflow personnel, and percentage of clerks. With these variables one can conclude that size is not predictive of changes in these dimensions.

TABLE 4 ABOUT HERE

Centralization and size are negatively related, thus an increase in size predicts a decrease in centralization. The one exception to this finding is the Holdaway et al. (1975) study. They report a positive relationship between size and centralization. Again as that study is based on very small organizations it would indicate that perhaps there is a curvilinear relationship. That is very small organizations increase their centralization as the size increases. This allows the chief executive to maintain control of the decision-making. At some size level the chief executive is unable to cope with the situations and commences to decentralize. After this size level is reached, further increases in size would

TABLE 4
Comparison of Findings on Interrelations Between
Organizational Size and Organizational Structural Variables

Structural Variables Size Studies											
	Specialization	Formalization	Autonomy	Centralization	Vertical Span	C.E. Span	Subordinate Span	% Workflow Superordinates	% MMF Personnel	% Clerks	Delegation
Pugh et al. (1968) 52 Organizations 31 Mfr. Firms	0.67 0.15	0.55 0.67	0.09 -0.23	-0.39 -0.47	0.67 0.77	0.32 0.28	0.05 0.04	-0.13 -0.31	0.36 0.52		0.13
Hinings and Lee (1971)	0.84	0.83	-0.10	-0.64	0.82	-0.23	-0.12	-0.73	0.39		-0.13
Child (1972) 82 Organizations 40 Mfr. Firms	0.61 0.65	0.58 0.69	0.18 0.10	-0.58 -0.74	0.65 0.63	0.15 0.36	0.13 0.23	-0.11 -0.03	-0.13 -0.06		
Holdaway et al. (1975)	0.43	0.43	-0.31	0.47				0.03			
Present Study	0.75	0.17	0.02	-0.41	0.68	-0.06	0.63	-0.20	0.12	0.26	0.85

predict a decrease in centralization.

Further examination of Table 4 shows previous studies report a significant correlation between size and structural variable formalization. However, the correlation in this study emerged as very different. The colleges together have developed many role defining documents, for example union contracts, group benefit programs, retirement pension plans, and a system of job description introduced by a consulting firm. As there was universal use among the colleges of these role defining documents and as the colleges operated as a unit in many of these areas, the relationships generally found between size and formalization disappeared.

Examination of the raw data showed that eleven of the colleges scored either seventeen or eighteen on this variable. There was so little variation in the scores that a relationship did not show up. Indeed the organizations may be homogeneous through the extent of formalization and the close control exercised by the Ontario government. Further one may question the results of the Holdaway et al. (1975) study. The Institutions of Technology, because of direct government control, may be more formalized than the other colleges. As the three institutes included in the study represented the large organization it may be the formalization relationship is due to factors other than size.

Additionally, a major intervening variable, complexity, may be an important determinant of other structural variables and in particular, formalization. Child (1973) postulated that complexity, while positively correlated with size, is a major predictor of formalization (documentation).

Defining complexity as consisting of specialization of role, specialization of function and level of specialist qualification, Child reported complexity "as an important intervening variable between the context of the organization (of which size is a key aspect) and its formalization" (Child, 1973: 183).

A further deviation from the previous studies appeared in the subordinate span of control. This deviation, however, was supported by Blau and Schoenherr (1971) who reported that larger agency's or divisions' first-line supervisors had a wider average span of control. Blau et al. (1976), also reported the span of control of first-line supervisors had a weak association with size. Blau clarified this relationship:

Although the association of size...with spans of control are generally weak, these zero-order correlations are misleading because the effects of size on most spans of control are concealed by the opposite influences of structural differentiation on them, as previous research indicated (Blau, 1972). When the three main forms of structural differentiation--number of levels, divisions, and sections--are controlled, size is revealed to exert strong influences on nearly all personnel components and spans of control (Blau et al., 1976: 26).

The literature provided conflicting findings on this relationship. The present study found a relationship (0.63) between size and supervisor span of control, thus the larger the college the wider the supervisor's span of control. While these findings supported Blau et al., it disagreed with Pugh et al. Reimann (1973) also reported that large factories have a wider span of control for middle- and first-line managers than small factories.

The relationship between organizational size and subordinate span of control may be characteristic only of similar types of educational institutions. Larger institutions have the resources to mount additional programs. These programs are sponsored by specific departments. As a result the department head has more instructors reporting to him thus increasing his span of control. However, further study on the supervisor's span of control is essential to verify the present findings.

The administrative ratio as indicated by the percentage of superordinates was related to size. The association was small, and was negative. Again other intervening variables may distort the effect of size on the configuration variable.

Theoretically, it appeared that as organizational size increased, changes occurred in certain specific dimensions of the college structure. That is, size appeared to affect a number of structural dimensions. As pointed out by Child (1973):

The proportion of variance in major dimensions of organizational structure predictable from knowing the size of organizations appears to be highly consistent across different samples of organizations (171).

One could not expect that all the variables in organizational structure would be predicted by the contextual variable organization size. Other contextual and intervening variables yet to be investigated may also influence structure.

The findings indicated that size is an indicator of specialization, delegation, centralization (negative), vertical span and supervisor span but not of the other structural dimensions. This suggests that other contextual variables may have a determining influence on these other

dimensions. It is furthermore possible that organizational size indirectly is related to structural dimensions through some intervening variable such as complexity.

The results of this investigation indicate that certain dimensions of that organizational structure could be predicted from a knowledge of organizational size in this sample of twenty colleges. It should be stressed however that these relationships may not necessarily be obtained for all colleges or indeed for all organizations. To arrive at such a conclusion on the basis of one study involving twenty homogeneous organizations would seem premature. However, when this finding is added to the findings in other studies, one would tend to conceptualize the forgoing size-structural relationship as consistent in all organizations.

Child's "Predicting and understanding organization structure" (1973), presented a logical and rational representation of organization context and organization structure. This representation was the suggested relationship as summarized in Child's national study. Child viewed the contextual variables as directly and indirectly causal of the structural variables. Applied to the findings of this research, one interpretation of the structural system is given in Figure 1.

It should be noted that Child's national study was a replication of the Aston group. According to Child's model size was correlated with the more important bureaucratic structural variables. In the present study, size seems to be related to four structural dimensions. Formalization was not supported, contrary to previous studies.

The present study does caution against over-generalization of results. The population was small and included a variety of locations. While caution is advised, and while the population selection controlled the other contextual variables, one might conclude size is generally a determinant of organizational structure.

 FIGURE 1 ABOUT HERE

In summary, the findings of this research supported the theory of organizational size. Size, as the uncontrolled independent variable, was found to be a potent predictive variable of organizational structure. This variable was positively related to specialization, delegation, levels of authority, and supervisor span, and negatively related to centralization.

The secondary purpose of the study was achieved in that the applicability of the Aston methodology for research on educational organizations was demonstrated. The merits of this methodology include:

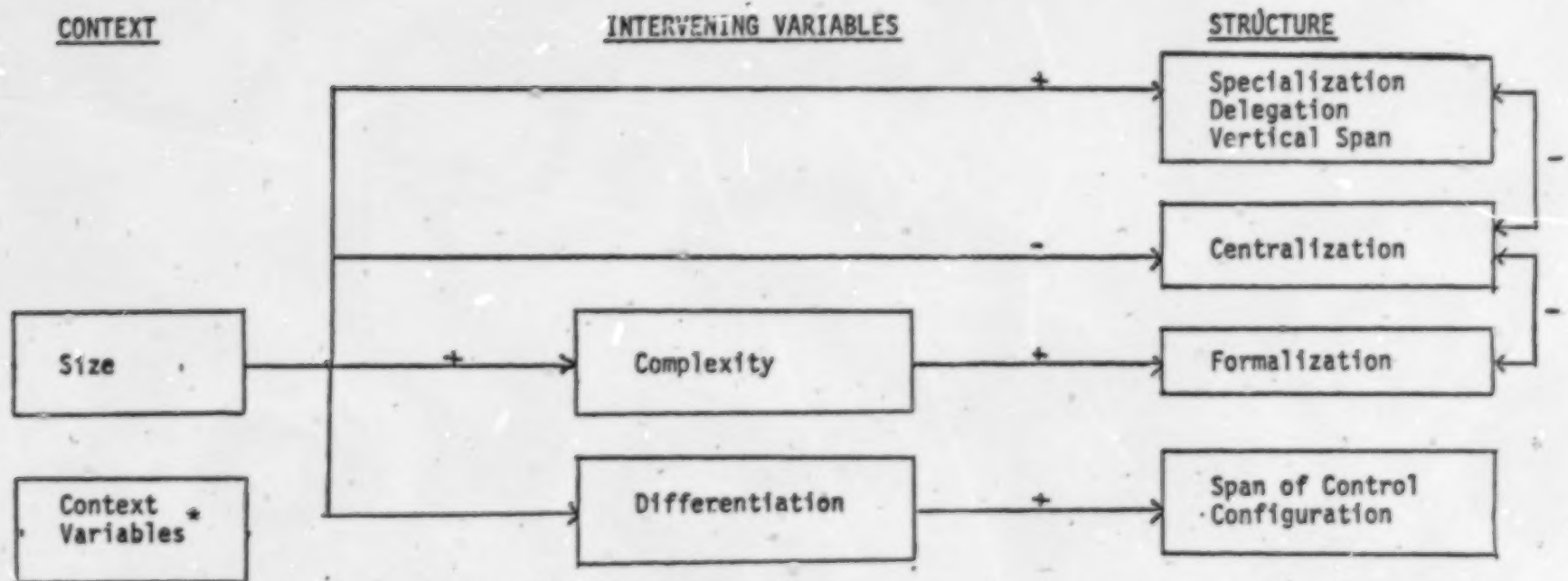
1. The use of a standardized measuring system allowing the gathering of objective rather than subjective data.
2. The power of discrimination in the variable scores among institutions with identical educational functions.
3. The little time required to obtain the data from each institution.
4. The elimination of the problem of partial returns.

The major limitations of the methodology are as follows:

1. The theoretical and descriptive evidence concerning structural dimensions and size dimensions are limited to the formal organization.

FIGURE 1

A Modified Model of Contextual and Structural Relationships
For Ontario Colleges of Applied Arts and Technology
Based on Child's Organization Structure



* Other contextual variables, for example technology, when they are not held constant may directly or indirectly affect or partially determine the structural dimensions.

2. The methodology ascertains the formal structure of the organization which may be at variance with what actually occurs.
3. The selection of the respondents within the institution may provide biased and inaccurate data.

CONCLUSION

By controlling some of the most relevant context variables, this study was able to concentrate its efforts to studying one specific context variable, organizational size, and to studying the structural variables of organizational bureaucracy. Thus the major purpose of the present study was to determine:

- (1) a readily available measure of the size concept, and
- (2) the relationship that exists between organizational size and organizational structure.

The variable size was operationalized as four measures. It was hypothesized there is a significant relationship between these measures. All measures intercorrelated ($r > .80$); the measure "number of full-time employees" had a strong association with each of the other measure of size so that the number of full-time employees was an adequate measure of that variable.

As expected, it was found that a relationship existed between the size variable and certain of the structural dimensions. Size was positively related to specialization, delegation, vertical span, supervisory span (subordinate ratio), and was negatively related to centralization. However, the forecasted size-formalization relationship

was very small. The fact that the size variable showed a strong relationship with certain organizational structural variables led to the conclusion that size is important in influencing structural dimensions in the organization.

The results contribute to organization theory in three ways:

- (1) The number of full-time employees is supported as an adequate measure of size;
- (2) The Aston generalization of the relationship between organizational size and certain dimensions of organizational structure is upheld; and,
- (3) The Aston proposition that size is predictive of structure is supported.

Since the present study was a field study, using cross-sectional data, generalizations of the results were made with caution, and may only apply to the college population. The results could be affected by inadequate control of the independent contextual variables, or could be a function of some intervening variables. Nevertheless, these results seem to support the relationships between organizational size and organizational structure, and to support the size-structure predictions of the variables investigated.

REFERENCES

24.

- Anderson, T.R., & Warkov, S. Organizational size and functional complexity: A study of administration in hospitals. American Sociological Review, February 1961, 26 (1), 23-28.
- Bakke, E.W. Concept of social organization. In M. Haire (Ed.) Modern organization theory. New York: John Wiley and Sons, Inc., 1959.
- Blau, P.M., Fable, C.M., McKinley, W., & Tracy, P.K. Technology and organization in manufacturing. Administrative Science Quarterly, March 1976, 21 (1), 20-40.
- Blau, P., & Schoenherr, R.A. The structure of organizations. New York: Basic Books, Inc., 1971.
- Champion, D.J., & Betterton, H. On organization size and administrative ratio. Pacific Sociological Review, January 1974, 17 (1), 98-107.
- Child, J. Organization structure and strategies of control: A replication of the Aston studies. Administrative Science Quarterly, June 1972, 17 (2), 163-177.
- Child, J. Strategies of control and organizational behaviour. Administrative Science Quarterly, March 1973, 18 (1), 1-17.
- Dale, E. Planning and developing the company organization structure (Res. Report No. 20). New York: American Management Association, 1952.
- Entwistle, D.R., & Walton, J. Observations on the span of control. Administrative Science Quarterly, March 1961, 5, (4), 522-534.
- Hall, R.H. An empirical study of bureaucratic dimensions and their relation to other organizational characteristics. Doctoral dissertation, Ohio State University, 1961.
- Hall, R.H. The concept of bureaucracy: An empirical assignment. The American Journal of Sociology, 1963, 63, 32-40.

Hall, R.H., Haas, J.E., & Johnson, N.J. Organizational size, complexity, and formalization. American Sociological Review, December 1967, 32 (6), 903-912.

Hickson, D.J., Pugh, D.S., & Pheysey, D.C. Operations technology and organization structure: An empirical reappraisal. Administrative Science Quarterly, 1969, 14, 378-397.

Hinings, C.R., & Lee, G.L. Dimensions of organizational structure and their context: A replication. Sociology, January 1971, 5 (1), 82-93.

Holdaway, E.A., & Blowers, T.A. Administrative ratios and organization size: A longitudinal examination. American Sociological Review, April 1971, 36, 278-286.

Holdaway, E.A., Newberry, J.F., Hickson, D.J., & Heron, R.P. Dimensions of organizations in complex societies: The educational sector. Administrative Science Quarterly, March 1975, 20, 37-58.

Inkson, J.H.K., Pugh, D.S., & Hickson, D.J. Organizational context and structure: An abbreviated replication. Administrative Science Quarterly, 1970, 15 (3), 318-329.

James, T.E. The administrative component in complex organizations. Sociology Quarterly, Fall 1972, 13 (4), 533-539.

Khandwalla, P.N. Mass output orientation of operations technology and organizational structure. Administrative Science Quarterly, December 1974, 19, 74-97.

Kimberly, J.R. Organizational size and the structural perspective: A review, critique and proposal. Administrative Science Quarterly, December 1976, 21 (4), 571-597.

Pugh, D.S., & Hickson, D.J. The comparative study of organizations. In Denis Psym (Ed.), Industrial Sociology. Baltimore: Penguin Books, 1968.

Pugh, D.S., Hickson, D.J., Hinings, C.R., MacDonald, K.M., Turner, C., & Lupton, T. A conceptual scheme for organizational analysis. Administrative Science Quarterly, December 1963, 8 (3), 289-315.

Pugh, D.S., Hickson, D.J., Hinings, C.R., & Turner, C. Dimensions of organization structure. Administrative Science Quarterly, June 1968, 13 (1), 65-105.

Pugh, D.S., Hickson, D.J., Hinings, C.R., & Turner, C. The context of organization structure. Administrative Science Quarterly, March 1969, 14 (1), 91-114.

Reimann, B.C. On the dimensions of bureaucratic structures: An empirical reappraisal. Administrative Science Quarterly, December 1973, 18, 462-476.

Rushing, W. The effects of industrial size and division of labor on administration. Administrative Science Quarterly, September 1967, 12, 273-295.

Woodward, J. Management and technology. London: Her Majesty's Stationary Office, 1958, 1965.

UNIVERSITY OF CALIF.
LOS ANGELES

MAY 18 1979

CLEARINGHOUSE FOR
JUNIOR COLLEGES